

NATIONAL VETERINARY RESEARCH

INSTITUTE, VOM

MISSION STATEMENT

To be the foremost Veterinary Research Institute in Africa, producing international quality standard vaccines and offering services for the identification, control and eradication of economically important livestock diseases, through best practices, research excellence and applying modern technology, with highly motivated, trained and experienced personnel.

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INTRODUCTION – by EXECUTIVE DIRECTOR



RESEARCH, SCIENTIFIC AND DEPARTMENTAL REPORTS

RESEARCH REPORTS

Estrogens in Pasture plants and their effects on Milk Secretion

This research project which was initiated in late 2003 proceeded to a reasonable level. Pasture grasses as well as local plants were assayed at two different stages of growth.

An increase in weight (size) of the two reproductive organs used as parameters in the study was observed indicative of the extracts having stimulatory effect and may be due to estrogen like substances. Though activity was detected in most of the plants assessed, the appropriate and specified estrogen standard could not be obtained for use, likewise the appropriate laboratory animal (usually mice).

Cell Culture Rabies Vaccine Development

The objectives of this study are to adapt the ex-egg rabies virus to Vero and BHK-21 cell cultures, produce cell adapted rabies seed virus, formulate the cell culture rabies vaccine and compare the new inactivated cell culture vaccine with the existing vaccine.

Two rabies virus antigens, namely Ex-egg rabies vaccine seed virus and EX-CEE ampoule rabies virus were used for adaptation and propagation. The vaccine seed was tested and found to be free of bacterial

Table 1: Titer of LSDV, SGPV in Microtiter plate and in cattle and goat

Method of titration	Titre (log ₁₀ /ml)
Lt cells in Microtiter plates LSDV	5.5 TCID ₅₀
Multiple Intradermal Inoculation LSDV	4.0 ID ₅₀
SGPV	5.25 ID ₅₀

contamination. For virus adaptation, the vaccine candidate has been partially adapted to Vero cells. Log₁₀ Mice Lethal Dose 50% was carried out. The fifty percent (50%) lethal dose infectivity of the rabies virus antigens determined in 3-week old mice were found to be 10^{-3.75} log₁₀ LD₅₀ for virus type Ex-egg RVS and 10^{-2.0} log₁₀ LD₅₀ for virus type EX-CEF RVS. The virus is yet to be passaged in BHK-21 cell monolayer due to lack of BHK-21 cell culture systems and a few other necessary requirements.

Development of Capripox Vaccines (further work)

The three Capripoxviruses, LSDV, SPV and GPV earlier grown (2004 Annual Report) and attenuated by passages in different cell lines, characterized by the SNT and PCR techniques, reactivated, adapted to lamb testis cells, freeze-dried and assessed for freedom from contamination from bacteria and fungi were titrated in lamb testis cells, cattle, sheep and goats for the determination of minimum effective dose. The results of the titrations of the Lumpy Skin Disease vaccine virus (LSDV) and the sheep and goat pox vaccine virus (SGPV) in microtiter plates and intradermally in cattle and goat were as summarized in table 1.

Diagnosis of Peste Des Petits Ruminants (PPR) in Sheep and Goats

The objective of the study was to confirm the diagnosis of PPR in field samples. A total of 28 caprine tissues and 53 caprine sera as well as 18 ovine sera were received from States for PPR diagnosis in 2005. CIE was used for the tests. The results obtained are as presented in table 1.

Table 1: Results of PPR diagnosis in field samples

No. of Samples tested		No. Tested Positive		% Tested Positive	
Caprine	Ovine	Caprine	Ovine	Caprine	Ovine
Tissue	28	-	19	67.9	-
Sera	53	18	27	50.9	16.7

Through this project it was possible to assist the States in the diagnosis of PPR especially under the PACE project.

Isolation and characterization of Newcastle disease virus isolates from recent outbreaks in commercial and free-range chickens across Nigeria in 2005.

Thirty-three (33) tissue samples were received from reported ND outbreaks in Edo, Taraba, Kaduna, Bauchi and Plateau. Attempts were made to isolate the causative agent using specific antibody negative (SAN) embryonated eggs. Five (5) isolates were obtained during the isolation process. Partial characterization of the isolate by Mean Death Time (MDT) and Intra-cerebral Pathogenicity Index (ICPI) has been done. Also twenty four (24) isolates were characterized by MDT in 9-11 day-old chicken embryonated eggs and twenty six of the isolates characterised by ICPI was re-confirmed from the previous year (2004).

MDT and ICPI results of the five isolates in 2005 revealed two (2) mesogenic, one (1) velogenic and the remaining two (2) still awaiting characterization. The re-confirmed result of 2004 includes six (6) isolates as mesogenic by MDT, four (4) as velogenic and one (1) lentogenic. Similarly, Three (3)

isolates had ICPI value of 0.0, 0.0, and 0.6 while ten (10) of the isolates had ICPI values of between 1.6 – 1.7.

The project achieved the set objective of collecting and characterizing ND isolates from some part of the country with the establishment of type culture for Newcastle disease isolates.

Serological Survey of Infectious Bursal Disease Virus (IBDV) Antibodies and Antigen in Local and Commercial Flocks in Nigeria

Fifteen (15) tissue samples (bursae) were obtained from reported IBD outbreaks in Adamawa, Bauchi, Nassarawa, Kwara and Edo States. Samples were processed and tested for IBDV precipitating antigen by AGID test.

Similarly, Two hundred and fifty-three (253) serum samples were collected from eleven (11) different commercial farms with history of IBD vaccination in Plateau State.

Ten (10) out of the fifteen (15) samples (66.7%) were positive for IBDV antigen precipitating antigen by AGID. Result of the IBD seromonitoring is as shown in Table 1 below:

Table1: IBD seromonitoring in vaccinated commercial farms

S/N.	State / Local Govt. Area	No. of samples tested	No. of positive samples	Percentage of positive samples	No. of doses of IBDV received
1	Plateau(Jos North)	52	0	0	2
2	Plateau(Jos North)	25	0	0	1
3	Plateau (Jos South)	11	9	81	2

4	Plateau (Jos South)	30	19	63.3	2
5	Plateau (Jos South)	24	4	16.7	2
6	Plateau (Jos South)	16	2	12.5	2
7	Plateau (Jos South)	24	16	66.7	2
8	Plateau (Jos South)	15	0	0	2
9	Plateau (Jos South)	16	9	56.3	2
10	Plateau (Jos South)	20	3	15	
11	Plateau (Jos South)	20	9	45	3

Objectives achieved include investigation of cases of IBDV, collection of data on IBDV from some part of the country and advising farmers on the best vaccination regime and bio-security measures.

Investigation of both ecto and endo-parasites of newly introduced exotic birds in NVRI

The objectives of this project were to identify possible parasites present the birds, carry out parasite count to determine the worm burden and prepare permanent mounts of the ecto-parasites as teaching aids.

457 faecal samples from the various birds and 55 feathers were collected between the months of April to December 2005 and were all examined for parasites.

Out of 93 samples from Guinea fowl, 2 were positive for *Eimeria spp*, 2 for *Hamnolepsis nana*, and 1 for *Capillaria collumbrae*. 84 faecal samples were examined from chickens naked neck and Black bantam chickens. Out of these 5 were positive for *H. nana*, 2 for *Eimeria spp* while 14 samples were positive for *Ascaridia galli*.

All the 74 faecal samples from quails, 33 from ostriches, 94 from Geese and 22 from turkeys were negative for endoparasites, while one out of the 66 obtained from Ducks (Nules) was positive for *Capillaria retusa*.

Thus, the objective to identify possible parasites present in the newly introduced birds was achieved with the parasites mentioned

above. It also proves that the parasites can transmit the diseases associated with them.

Use of Momordica Balsamina fruit extract in the control of coccidiosis in rabbit (progress report)

The aqueous fruit bark extract of *Momordica balsamina* a plant with world wide distribution used in Plateau State by local Poultry farmers for general well being of birds have been studied. The study is an attempt to verify the claims of local people that the fruit of *Momordica balsamina* is effective in the treatment of Coccidiosis.

Rabbits weighing between 1.2 – 1.5kg were challenged in groups and treated with 200mg/kg body weight of the plant extract. Faecal Oocysts, body weight and temperature were examined over a period of twenty days. Serum AST, ALT, ALP and total bilirubin and protein were monitored on days 1, 5, 15 and 20. Gross pathological examinations of dead or surviving animals were carried out. The phytochemical analysis to determine active principles were carried out. Results show that the extract enhanced the clearing of Oocysts.

Epidemiological Studies and the Development of Control Measures against Haemoparasites in Domesticated Animals

The objectives of this study includes, establishment of the seasonal prevalence pattern of trypanosomiasis in cattle in Vom, the role of the introduction of cattle

from other agroecological zones in the epidemiology of trypanosomiasis.

Work done so far includes collection and analysis of whole blood of cattle from LID, NVRI Vom using Thin and thick Smear, and the Buffy coat techniques. Fly traps were also set on the different occasions that the blood were collected, and checked 24 hours latter for any catch. The analysis of the blood samples collected shows that out of the 56 cattle sampled so far, none was positive for *Trypanosoma spp* but 11 (19,64%) were positive for *Anaplasma spp* and 6 (10.71%) for *Babesia spp*. None of the traps set caught flies. This may be attributed to the dry season, a period when most insects are known to hibernate.

Development of *Pasteurella multocida* (FCV) iron regulated protein bacterin for birds

The objectives of this project include; comparative pathogenicity studies between the current Vom FCV strain and avian Nigerian field isolates of *P. multocida*, development of a *P. multocida* iron-regulated outer membrane proteins (IROMPs) vaccine for birds, assessing the homotypic immunity of the vaccine in birds and the assessment of the heterotypic immunity of the vaccine in birds. Achievements made from the set objectives include; virulence determination in mice of the vaccine strain (*P. multocida* A: 1) and a Nigerian field isolate (*P. multocida* A: 4), LD50 of the challenge strain of *P. multocida* was determined in quail birds to be approximately 10^9 cfu/ml, the *P. multocida* IRPs bacterin was successfully prepared using brain heart infusion broth plus 2, 2-dipyridyl iron chelator and sodium alginate adjuvant. Other achievements made were, intramuscular vaccination of birds (chickens) with the IRP bacterin done in parallel with the current

NVRI – FC vaccine with sera for antibody detection in the birds collected on days 0, 7, 14 and 28 post vaccinations. A booster dose was given 2 weeks post initial vaccination. The challenge of the birds with virulent *P. multocida* was conducted on day 30 to assess level of protection – The challenge experiment gave inconsistent results due perhaps to the type of birds employed (cockerels). Cockerels are known to be quite resistant and resilient to infection. The experiment will be repeated using amenable birds such as layers/broilers.

Survey of Infectious Coryza in Nigeria

The objectives of this study are to conduct epidemiologic studies of infectious coryza using serotyping and biotyping methods, conduct phenotypic and molecular characterization of *Haemophilus paragallinarum* strains, establish the serotypes causing the disease in Nigeria and to develop a vaccine for the control of Infectious Coryza in Nigeria.

Work done include preparation of Hpg HA antigen to determine the HA titre which was found to be 1:64. Serological test (HI) was conducted on 84 sera samples from Local Chickens, Turkeys and Ducks to determine whether they have antibodies to *Haemophilus paragallinarum*. Isolation of Hpg from clinical samples (Chickens) was attempted. Out of the 84 sera samples, 63 (75%) tested positive by the Haemagglutination Inhibition technique. From 18 suspected clinical samples screened only one appeared positive, though not fully confirmed.

Achievement made include; serological identification of *Haemophilus paragallinarum* in Nigerian poultry and development of capacity for the isolation of *Haemophilus paragallinarum*.

Pathogenicity Studies of *Dermatophilus congolensis* in Cattle.

The objective of this study is to understand the pathogenesis of the disease, vis- a- vis the role played by bacteria, viruses, fungi etc. in the establishment of the disease. This will make for better understanding of its control.

Ten (10) cattle aged 1^{1/2} – 3 years were used for the experiment. Six were males while four were females. Two were Friesian x Bunaji cross while the others were pure Bunaji of the white Fulani breed. They were screened for helminthes using the floatation and sedimentation techniques. All the animals had helminths; *cooperia*, *oesophagostomum*, and *Faciola* species. *Eimeria zurnii* 1500 – 2500 epg was also detected. These conditions were utilized to mimic what obtains in a field situation. The animals were, thus, not medicated. The animals were divided into five groups (1 control and 4 treatments) of two animals per pen. Three sites; 4cm wide on the dorsal part of the flanks of each animal were shaven. The right side was scarified with sand paper (grade 2) until there was evidence of hyperemia but without bleeding. The right side of the animals dosed by swabbing with:

(a) Group 1: 10¹⁰ colony forming units (cfu) of *D. congolensis* isolate, (b) Group 2:10¹⁰ cfu of *D. congolensis* and *Staphylococcus aureus*, (c) Group 3:10¹⁰ *D. congolensis* and 1ml of *Trichophyton mentagrophytes*, (d) Group 4:10¹⁰ cfu *D. congolensis* and *S. aureus* and *T. mentagrophytes*, (e)Group 5: 5ml of PBS only. *D. congolensis* was recovered from infected sites. It was observed that lesions were severe in animals with the high helminthosis. Lesions persisted for 21 days in a Bunaji cattle inoculated with *D. congolensis* only while the second animal in the group which is a Muturu x Friesian cross also had mild lesions which resolved from day 8 post infection. Lesions were also very severe in the group with *D. congolensis* and *S. aureus*. Lesions seen in the animals include exudation, erythema, scaling and flakes from day 3 post

infection in all animals in groups I – IV. Subcutaneous nodules were observed in test Group 1 (*D. congolensis* alone) before scaling. Severe crust formation, scaling and flaking were observed as from day 4 post infection. Scaling, flaking and crust formation were advanced by day 7 post infection but stopped by day 8 post infection (pi). The crust formation in animals in Group 1 persisted till day 21 post infection. These signs were seen in the shaved and scarified area. No lesions were observed in the wetted, unshaved and pricked areas for the entire duration of the experiment. Objective achieved in this experiment was the establishment of experimental Dermatophilosis in cattle using *D. congolensis*, *S. aureus* and *T. mentagrophytes*.

Molecular Prevalence Studies of ASF and Characterization of ASFV in Nigeria

The objectives of this work include study of the prevalence of ASF in Nigeria and characterization of ASF isolates from outbreaks in different parts of the country using Molecular techniques; establishment of a speedy, accurate and reliable PCR diagnosis of ASF.

Surveillance trips to 4 areas (Kafanchan, Makurdi, Gboko, Barikin Ladi and Jos) within the North Central Zone out of the 3 Zones (South West, South East, North Central) designated in the project plan for surveillance was carried out. A total of 136 samples were collected and 18 were received through the Diagnostics Department of NVRI, Vom representing Jos Wildlife (5), Abeokuta (4) Oturkpo (9). Information gathered during the surveillance revealed that ASF is endemic in Benue State and has been a source of concern for the state Government and the farmers. PCR analysis with primers prescribed for ASF diagnosis in the 2000 Edition of OIE Manual of Standards for Diagnostic Tests and vaccines, gave the following results:-

Location	No. of Samples	No. of Samples +ve	No. of Samples -ve	Inconclusive
Abeokuta (Ogun State)	4	4	-	-
Barkin Ladi (Plateau State)	2	2	-	-
Jos-Abattoir (Plateau State)	9	-	-	9
Jos – Wildlife (Plateau State)	5	5	-	-
Gboko (Benue State)	27	8	19	-
Kafanchan (Kaduna State)	60	51	8	-
Makurdi (Benue State)	21	2	18	-
Oturpko (Benue State)	9	9	-	-
Total	136	81	45	10

+ - Samples collected
 * - Samples received

The above results indicate a high ASF incidence in Kafanchan (85%). Gboko and Makurdi had low percentage positive of 29% & 9% respectively. Barkin Ladi and Oturpko samples which were all positive were post mortem samples from dead pigs clinically diagnosed to have ASF. The Jos Wildlife samples were from Red river hog and all were positive. These results point to the fact that ASF is endemic in the North Central region of Nigeria. There is the need to continue the prevalence studies over a period of time (2-3 years) to fully establish ASF prevalence in the country. This should go hand in hand with eradication programmes.

For the ASFV Characterization; Restriction Fragment Length Polymorphism (RFLP) study began with VP72 gene based characterization. The VP72 gene encodes the P72 major capsid protein. This protein has been associated with virus entry into the host cells. Forty samples were selected from samples received and collected from outbreaks cases in different parts of the country (North Central – 34; South-West – 3; South-East – 3). ASFV DNA was initially confirmed by amplification of a 278 bp fragment, with primers prescribed for ASF diagnosis in the 2000 edition of OIE Manual of Standards for Diagnostic Tests and Vaccines. Twenty-six (65%) of the samples amplified the VP72 gene

(1.9kb) and 14 were negative for the gene. Four of the negative samples were the Red river hog (*Phacochoerus spp*) specimens which was diagnosed clinically and by the OIE PCR ASF diagnosis to harbour the ASF virus. The remaining negative samples for VP72 gene were from Gboko (BN) – 4; Kafanchan (KD) – 3; Ibadan (OY) – 2. The Ibadan samples were from 1st and 2nd generation off springs of ASF survivor boar testis.

The samples analyzed for VP72 gene can be classified into two (VP72 positive and VP72 negative). The Red river hog and ASF survivor samples were peculiar, giving 2-3 fragments that were less than the VP72 gene. A more detailed investigation of the variants would be carried out to classify them. These variants seem to have some genotypic differences from ASFVs of other outbreak cases. One can speculate the occurrence of evolutionary mutation over time such that the VP72 gene of the Red river hog could be a primitive variant different from the ten major genotypes on the African continent (Bastos et al, 2004).

Preliminary RFLP analysis using the VP72 gene revealed restriction sites for 2 enzymes (TaqI and EcoR II). TaqI had 3 restriction sites, while EcoRII had 2 restriction sites on

the VP72 gene. All the VP72 genes of the samples used in the restriction analysis had the same number of sites and fragment (4 & 3) respectively. A detailed RFLP analysis of all the genes will continue in the course of the project, followed by RFLP analysis of the whole genome of the different isolates from different parts of Nigeria. Viral isolation from samples collected in different parts of the country will be done concurrently.

Objectives achieved so far include 1) the use of PCR diagnostic method in NVRI Vom in the assessment of the prevalence of ASF in the North Central Region of Nigeria, 2) Partial characterization of ASFV in clinical samples collected from the North Central zone based on the VP72 gene has been achieved.

SCIENTIFIC PUBLICATIONS

1. **Retrospective study on the prevalence of canine myiasis in Jos-South LGA of Plateau State, Nigeria**, Jambalang, A., Ogo, I. N., Mwansat, G. S., Ogo, M. F., Onovoh, E., Ogunsan, E. A., Dogo, G. I., Banyigygi, S., Odoya, E., Chukwu, O. O., Yako, A. B., Inyama, P. U. (2005). *Journal of Pest, Disease and Vector Management* **6**: pp. 385-390.
2. **A Retrospective study of Biting Dogs and Rabies in Vom Plateau State**, Garba A., Oyetunde, I. L., Kumbish, P. R., Clement, A. M., Chiko, K. J., Ahmed, J. S., Lapang, H. B., Dashe, Y., Tunde, O. and Banyigygi, S. A. (2005). *Vom Journal of Vet. Science* **1**: No.2, pp. 57-63.
3. **Experimental haemorrhagic septicaemia of calves with *Pasteurella multocida* serotype E: 2: Clinical, pathologic and microbiologic studies**, Odugbo, M. O., Turaki, U. A., Itodo, A. E., Okwori, A. E. J. and Yakubu, R. A. (2005) *Revue d'élevage et de médecine vétérinaire des pays tropicaux* **58** (3) (In Press)
4. **Abortion due to *Brucella abortus* in sheep in Nigeria**, Ocholi, R. A., Kwaga, J. K. P., Ajogi, I. and Bale, J. O. (2005). *Technical and Scientific Review of Office of International Epizootics*, **50**(3) (In press)
5. **Prevalence of *Listeria* Species in Slaughtered bovine carcasses in Jos abattoir, Nigeria**, Muhammed M. J., Chukwu, O. O., Ngulukun, S. S., Ogbonna, C. I., C., Onwuliri, F. C., Okewole, P. A. (2005). *Bulletin of Animal Health Production in Africa*. (in press).
6. **“Dermatophytes and other Agents of Human Skin Infections in Jos, Plateau State, Nigeria**, Ta’ama, L., Makinde, A.A. Lombin, L. H., Lamorde, A. G., Ironkanulo, E. A., Kwanasashi, O. C., Shaibu, S. J., Sadiq, Y. and Garba, A. (2001). *Journal of Medical laboratory Sciences* **10**: 52 – 60.
7. **Sodium Dodecyl Acrylamide Gel Electrophoresis on some Bacteria Associated with Dermatophilosis** S. J. Shaibu, A. B. Suleiman, Ta’ama L., and Makinde, A. A. (2002). *Journal of Natural Sciences* (In press)
8. **Primary Education, Peace and Stability in Nigeria: In Education and the stability of the Nigerian Nation**, Ugbong, C. J. I. and Okezie, I. C. (2005). Education Trust Fund, Federal College of Education, Pankshin, Plateau State, Nigeria, pp 70.
9. **Toxoplasmosis in chicken and its public health risks**; Itodo, A. E., Ogbe, A. O.; Musa, U. and Abechi, S. (2005). *Journal of League of Researchers in Nigeria*. **4** (2): pp. 122-124.
10. **Detection of African Swine Fever Virus antibodies by the Immunoblotting assay from a suspected outbreak of African swine fever at the National Veterinary Research Institute’s Piggery**, Luther, N. J; Majiyagbe, K. A.; Shamaki, D.; Umoh J. U.; Udeani, T. K. C.; Nwankpa, N.; Opara, J. and Fasina F. O. (2005). *In: African Journal of Natural Sciences*: (In Press)
11. **Studies on the prevalence of antibodies to peste des petits ruminants virus (PPRV) among goats in Bauchi State**. Luther, N. J. and Goni, D. (2005), *Nigerian Veterinary Journal* (In Press).
12. **A Tissue Culture Test for the Detection of African Swine Fever Virus in *Ornithodoros moubata procinus* (Soft Ticks/Argasidae)** Fasina, F. O., Phir, C. O., Luther, N. J. (2005). *Vom Journal of Veterinary Science* (In press).

DEPARTMENTAL REPORTS

Biochemistry Department

Four research projects which started in 2003 were either completed or formally terminated in accordance with the Institute's directives on on-going projects within the period under review.

The NEF-NVRI Toxicology Internship programme, collaboration between the Institute and the African Education Initiative, a USA based NGO was held from 19th May – 17th August, 2005. A major part of the training programme was carried out within the Department with some members of the Department serving as resource persons.

A total of 550 litres of liquid detergent and 1,037.3 litres of distilled water were produced for the institute by the department within the period under review. Samples brought to the department for various types of analysis totalled 3, 136, while consultancy services were also offered to feed millers, farmers, students and scientists.

Bacterial Research Department

During the year under review, a total of 210 serum samples were tested by rose Bengal plate test (RBPT) and serum agglutination test (SAT), while 194 milk samples were tested by milk ring test (MRT) for *Brucella* antibodies. Eighty (38.1%) of the serum samples, and 90 (46.4%) of the milk samples, tested positive for *Brucella* antibodies.

A total of 131 samples comprising vaginal swabs, milk, whole blood, lymph nodes and hygroma fluid were received and cultured on serum dextrose agar for the isolation of *Brucella*. Two *Brucella* isolates were obtained from the culture samples. Sera, tissue samples and CBPP vaccine were submitted to the unit for analysis. Out of 472 sera samples, 89 were analyzed by c-ELISA and 16 of them were positive. The remaining samples could not be analyzed due to exhaustion of ELISA kits. A total of 251 tissue samples (comprised of

lungs, nasal swabs, ear swabs, lymph nodes and pleural fluid from cattle and small ruminants) were cultured for isolation and 13 of them were positive. Three batches of CBPP Vaccines (comprising of 10 vials) were analyzed for purity and viability.

A total of 10 vials each of 23 field isolates of *Mycoplasma* recovered from cattle and small ruminants were successfully freeze-dried and preserved.

Experiment was carried out on shelf life of transport medium of *Mycoplasma* at various keeping temperatures and it was found that both the freeze-dried and non-freeze-dried broth can support the growth of *Mycoplasma* for almost one year at -20, +4, +25 (room temp) and +37°C respectively. Experiment was also carried out to determine the effect of temperatures on isolate of *Mycoplasma* with and without preservatives and it was found that *Mycoplasma* isolates kept in a micronic tubes survive better without preservatives (like stabilizer or glycerol) for a period of 2months at +37, +4 and -4°C; 3 months at -20°C; 4 months at 25°C and above 5 months at -70°C

Bacterial Vaccine Production Department

The activities of the Department was carried out much more progressively during the period under review due to better working conditions; readily available raw materials and improved staff disposition to work. The general production figures of 17,596,460.0 doses of all eight vaccines for 2005 showed an increased of 7.8% over that of the year 2004. However, individual figures according to vaccines, differed; from low to high. All productions realized were based on demand of the vaccines by end users. As a result, more awareness campaign on use and availability of N. V. R. I. vaccines should be made. The CBPP vaccine was in very low demand in 2005, a situation that affected the overall production figure.

VACCINE PRODUCTION FIGURES FOR YEAR 2005

Number of Doses Produced in 2005

MONTH	ASV	BV	BQV	HSV	CBPP	FCV	FTV	HANTAVAC	Total
January	358,600	-	-	37,380	220,900	259,000	356,100	-	
February	-	-	215,500	26520	440,300	140,500	-	32,760	
March	-	117,500	-	24,340	456,900	177,400	413,500	-	
April	-	-	500,500	29,020	1,114,800	128,800	557,000	24,620	
May	424,000	-	294,000	23,040	315,300	63,200	376,600	21,560	
June	818,000	-	-	50,520	460,200	186,200	440,800	34,000	
July	-	-	-	13,160	476,300	82,800	1,103,200	-	
August	-	-	102,100	24,680	435,900	365,800	343,100	33,600	
September	202,400	-	-	-	-	-	-	-	
October	-	-	-	38,400	-	158,800	-	34,480	
November	-	381,500	-	63,360	-	101,400	479,900	-	
December	-	-	-	32,720	-	144,200	900,000	20,400	
Total	1,803,000	499,000	2,031,000	363,140	3,920,600	1,808,100	4,970,200	201,420	17,596,460.0

Production Figures For 2004

Vaccine	ASV	BV	BQV	HSV	CBPP	FCV	FTV	Hantavac	TOTAL
Produced	2,181,400	63,200	1,949,000	311,720	6,872,500	1,248,600	3,572,500	182,560	16,318,580.00

Number of Doses Issued out from the Department in 2005

MONTH	ASV	BV	BQV	HSV(O)	HSV(S)	CBPP	FCV	FTV	HANTAVAC
January	-	-	-	21,140	-	-	106,300	-	-
February	356,200	-	209,500	41,800	-	657,400	289,600	354,200	32,280
March	-	-	-	-	-	-	175,000	410,400	-
April	-	-	494,500	23,860	-	-	126,400	242,000	-
May	419,200	115,700	-	-	51,340	-	60,800	684,800	45,460
June	398,000	-	-	-	25,960	1,565,300	181,400	-	-
July	-	-	288,000	-	23,120	-	80,400	438,700	33,520
August	-	-	-	-	36,880	-	286,200	803,800	33,120
September	410,400	-	1,015,000	-	-	-	72,200	-	-
October	-	-	-	-	38,120	310,900	156,400	403,700	35,600
November	-	305,600	-	-	62,360	458,200	96,600	145,900	-
December	197,600	-	-	-	-	-	141,800	477,800	-
Total	1,781,400	421,300	2,007,000	86,800	237,780	2,991,800	1,773,100	3,961,300	179,980

Infrastructural Development in the department in 2005

Below are the developmental Projects undertaken in the various sections of the Department in the year 2005:

Anthrax Section

Installation of a new class-3 lamina flow cabinet and installation of a new giant Memmert (100-800 series) incubator.

HSV/Brucella Section

Renovation (Partitioning) of the Section into black, grey and white areas with installation of 3 new work-benches.

CBPP Section

A new CO₂ Incubator, 2HP new Split Air Conditioner and acquired and 5 new working benches were installed while a Refrigerated Centrifuge (Mistral 4L) was rehabilitated for use.

BQV/Hantavac Section

A Bench top Memmert Incubator installed, 4 new work benches were fixed and a cloak room was constructed.

Wash-up/Sterilization Section

26 new trays (for moving 100 and 200ml bottles) were produced, a giant Memmert hot

air oven (100-800 series) was installed while two Electric autoclaves were rehabilitated.

Media Section

Changes that took place in this section include acquirement and installation of a new bench-top Memmert(100-800 series) hot air oven, new work benches constructed and fixed in the main media and sterile rooms, installation of a 2HP new Split Conditioner, two new Heavy Duty Blenders (ALDRICH LBC 10) and two new wash-hand basins. Other things done were the renovation of media room and construction of a cloak room in the Section.

FTV/FCV Section

A giant New Memmert (800 series) Incubator was installed with new work benches provided. A cloak room was constructed and the entire inner room of the section was renovated.

Departmental Stores

A new -80°C Revco Deep freezer was acquired and installed and one trolley for movement of bulk materials was purchased. Eleven (11) fire extinguishers were supplied to the Store and later distributed to various sections of the Department.

VIRAL VACCINE PRODUCTION DEPARTMENT

2005 VIRAL VACCINES MONTHLY PRODUCTION FIGURES

MONTH	TOTAL PRODUCED		TOTAL ISSUED		ESTIMATE
	Vials	Doses	Vials	Doses	=N=
January	9,495	1,899,000	9,426	1,885,200	1,885,200
February	94,296	17,207,806	89,108	16,179,335	18,516,050
March	34,036	7,843,400	335,781	7,741,900	7,467,100
April	80,767	12,386,249	80,465	12,322,580	16,600,100
May	37,917	9,334,200	37,647	9,262,200	9,376,200
June	55,243	11,011,307	53,322	10,112,087	11,209,950
July	70,245	12,269,542	69,764	12,181,700	14,056,850
August	13,061	2,612,200	12,964	2,592,800	2,674,150
September	35,952	7,190,400	35,718	7,143,600	7,590,150
October	96,479	18,418,210	95,944	18,315,190	19,605,300
November	40,662	9,193,500	40,422	9,136,200	9,255,050
December	22,911	4,582,200	22,794	4,558,800	4,558,800
Total	591,064	113,948,014	581,152	111,431,592	122,794,900

PRODUCTION FIGURES ON SPECIFIC VACCINE BASIS

Vaccine	Produced		Issued		Amount
	Vials	Dosed	Vial	Dosed	
NDVL ₂₀₀	197,103	39,420,600	195,750	39,150,000	39,150,000
NDVK ₂₀₀	100,328	20,065,600	94,832	18,966,400	23,708,000
IBDV	164,067	32,813,400	163,338	32,667,600	32,667,600
NDV i/o	24,234	4,846,800	24,048	4,809,600	4,809,600
FPV	39,480	789,600	39,352	7,870,400	7,870,400
PPRV	12,038	601,900	11,985	599,250	3,595,500
ARV(D)	35,914	35,914	35,842	35,842	5,376,300
NDVL ₅₀₀	13,258	6,629,000	11,434	5,717,000	4,001,900
NDVK ₅₀₀	2,368	11,840,000	2,328	1,169,000	1,169,000
NDV _{1/2}	2,274	454,800	2,233	446,600	446,600
Total	591,064	113,948,014	581,152	111,431,692	122,794,900

MONTHLY RECORD OF VACCINES PRODUCED AND ISSUED

Month	Vaccine	Produced	Doses	Issued	Doses	Amount
January	NDVL	4,730	946,000	4693	938,600	938,600
	IBDV	4,765	953,000	4733	946,600	946,660
TOTAL		9,495	1,899,000	9,426	1,885,200	1,885,200
February	NDVK ₂₀₀	13,424	2,684,800	8,560	1,712,000	2,140,000
	NDVL ₂₀₀	30,738	6,147,600	30,722	6,144,400	6,144,400
	NDV _{I/O}	4,044	808,800	4,014	802,800	802,800
	NDV _{I/2}	2,274	454,800	2,233	446,600	446,600
	FPV	4,884	976,800	4,854	970,800	970,800
	IBDV	29,411	5,882,200	29,258	5,851,600	5,851,600
	PPRV	4,965	248,250	4,932	246,600	1,479,600
	ARVD	4,556	4,556	4,535	4,535	680,250
TOTAL		94,296	17,207,806	89,108	16,179,335	18,516,050
March	NDVK ₂₀₀	4,799	959,800	4,767	953,400	1,191,750
	NDVL ₂₀₀	13,430	2,686,000	13,113	2,622,600	2,622,600
	IBDV	12,353	2,470,600	12,262	2,452,400	2,452,400
	NDVL ₅₀₀	3,454	1,735,300	3,435	1,718,000	1,200,350
TOTAL		3,4036	7,843,400	3,3578	7,738,900	7,467,100
April	IBDV	20,889	4,177,800	20,796	4,159,200	4,159,200
	NDVL ₂₀₀	17,772	3,554,400	17,652	3,530,400	2,530,400
	NDVK ₂₀₀	9,716	1,943,200	9,666	1,933,200	2,416,500
	NDV _{i/o}	4,342	868,400	4,312	862,400	862,400
	PPRV	7,073	353,650	7,053	352,650	2,115,900
	ARV(D)	13,599	13,599	13,630	13,630	2,044,500
	FPV	7,376	1,475,200	7,356	1,471,200	1,471,200
TOTAL		80,667	12,386,249	80,465	12,322,580	16,600,100
May	NDVL ₂₀₀	12,696	2,539,200	12,606	2,521,200	2,521,200
	NDVL ₅₀₀	3,468	1,734,000	3,438	1,719,000	1,203,300
	NDVK ₅₀₀	2,368	1,184,000	2,338	1,169,000	1,169,000
	NDVK ₂₀₀	12,684	2,536,800	12,594	2,518,800	3,148,500
	FPV	6,701	1,340,200	6,671	1,334,200	1,334,200
TOTAL		37,917	9,334,200	37,647	9,262,200	9,396,200
June	IBDV	6,213	1,242,600	6,272	125,400	1,254,400
	NDVL ₂₀₀	22,708	4,541,600	22,588	4,517,600	4,517,600
	NDVL ₅₀₀	2,799	1,399,500	1,069	5345,00	374,150
	NDVK ₂₀₀	12,181	2,436,200	12,091	2,418,200	3,022,750
	ARV(D)	4,407	4,407	4,387	4,387	658,050
	FPV	6,935	1,387,000	6,915	1,383,000	13,833,000
TOTAL		55,243	11,011,307	53,322	10,112,087	1,209,950
July	IBDV	23,445	468,900	23,324	4,664,800	4,664,800
	ARV	8,942	8,942	8,900	8,900	1,335,000
	FPV	6,898	1,379,600	6,875	1,375,000	1,375,000
	NDV _{i/o}	4,601	920,200	4,571	914,200	914,200
	NDVK ₂₀₀	11,074	2214,800	10,981	2,196,200	2,745,250
	NDVL	15,285	3,057,000	15,113	3,022,600	3,022,600
TOTAL		70,245	12,269,542	69,764	12,181,700	14,056,850

August	IBDV	6,858	1,371,600	6,827	1,365,400	1,365,400
	NDVK ₂₀₀	1,661	332,200	1,627	325,400	406,750
	NDVL	4,542	908,400	4,510	902,000	902,000
Total		13,661	2,612,200	12,964	25,928,000	2,674,150
September	IBDV	13,728	2,745,600	13,664	2,732,800	2,732,800
	NDVK ₂₀₀	8,992	1,798,400	8,931	1,786,220	2,232,750
	NDVL ₂₀₀	13,232	2,646,400	13,123	2,624,600	2,624,600
TOTAL		35,952	7,190,400	35,718	7,143,600	7,590,150
October	IBDV	40,623	8,124,600	40,456	8,091,200	8,091,200
	NDVi/o	4,173	834,600	4,138	827,600	827,600
	NDVK ₂₀₀	12,814	2,562,800	12,720	2,544,000	3,180,000
	ARV(D)	4,410	4,410	4,390	4,390	658,500
	NDVL ₂₀₀	34,459	6,891,800	34,240	6,848,000	6,848,000
Total		96,479	18,418,210	95,944	18,315,190	19,605,300
November	NDV i/o	4,305	861,000	4,274	854,800	854,800
	NDVL ₅₀₀	3,537	1,768,500	3,506	1,753,000	1,227,100
	NDVL ₂₀₀	19,837	3,967,400	19,747	3,949,400	3,949,400
	NDVK ₂₀₀	12,983	2,596,600	12,895	2,579,000	3,223,750
Total		40,662	9,193,500	40,422	9,136,200	9,255,050
December	FPV	6,686	1,337,200	6,666	1,333,200	1,333,200
	NDV i/o	2,769	553,800	2,739	547,800	547,800
	NDVL ₂₀₀	7,674	1,534,800	7,643	1,528,600	1,528,600
	IBDV	5,782	1,156,400	5,746	1,149,200	1,149,200
Total		22,911	4,582,200	22,794	4,558,800	4,558,800

Dagwom Farm

The farm is made up of Feed Mill, Fabrication, Rabbitry and Agronomy Sections. The department is responsible for the production of feed for all classes of livestock and poultry in the Institute. Other functions include fabrication of kerosene powered incubators, multiplication of rabbits and maintenance of seed bank for all genera of grasses, legumes and ethno pharmaceutical plants being used in the Institute.

In 2005, 55 incubators representing 41 of 300 egg capacity and 14 of 150 capacities were produced. These were sold to various State governments, Institutions, farms and individuals who requested.

Feed for various ages of poultry and rabbits were produced in the feed mill. However, only 575.27 tons instead of the projected 735 tons were produced. Soya oil processed during the

period also amounted to 8, 754 litres. The Pasture Development Section focused on seed multiplication and the expansion of the Dagwom Nursery. Activities were centered on Hay production, and vegetable gardening for small animals, Micro-Livestock and for poultry. The *Cassia alata* plantation being used for ethnoveterinary research by Dermatophilosis Centre was maintained.

The coffee plantation at Dagwom Farm was expanded from 500 stands to 1200 stands while

0.148 ha of stylozanthus guinensis and 0.232 ha of signal grass seed banks were established at the paddocks at LID along the Poultry Department

During the period under review, 213 adult rabbits, 207 weaners and 462 weaner rabbits were sold

to interested farmers, institutions and organizations.

Stores Department

The functions of the department are; to ensure uninterrupted flow of materials to the production and service departments, to hold sufficient stock in the most economical manner, maintain accurate records of orders received and issuance and to effectively manage scraps and obsolete stock of the Institute.

The Department successfully rendered the above functions in the year 2005.

During the period under review there with an appreciable increase in the sales of vaccines to our teaming customers. A total of 134,969,247 doses

of vaccines were received from the production departments and a total of 129,557,734 doses of vaccines were dispatched to customers. The dispatched figures show an impressive increase against that of 2004 figures.

Parasitology Department

The department has 5 units, namely; Protozoology, Helminthology, Ethnopharmaceutical, Entomology and Immunodiagnostic unit.

The occurrence of parasites in various animals samples were routinely screened during the period under review. A total of 631 blood samples were analysed. The result is as shown in the table below:

S/N	Animal species	No. of Pos.	% Positive	Parasites Identified
1	Bovine	1	0.15%	<i>Microfilariae</i> <i>Anaplasma marginale</i> <i>Babesia bovis</i> <i>T. vivax</i> <i>T. brucei</i> <i>Thileria spp</i>
		32	5.07%	
		26	4.12%	
		10	1.58%	
		4	0.63%	
2	Canine	15	2.37%	<i>Babesia canis</i> <i>Microfilariae</i>
		1	0.15%	
3	Caprine	1	0.15%	<i>T. congolence</i> <i>Anaplasma marginale</i>
	Ovine	2	0.31%	
4	Human	1		<i>Plasmodium falciparum</i>

Apart from blood samples screened, faecal samples were also screened and the result is as presented in the table below. A total of 219 samples were screened.

S/N	Animal species	No. of Pos	% Positive	Parasite Identified
1	Bovine (faecal)	16	7.31%	<i>Oesophagostomum radiatum</i> <i>Monezia Expansa</i> <i>Fasciola spp</i> <i>Strongyloides Spp</i> <i>Eimeria bovis</i> <i>Ascaris Spp</i> <i>M. Digitatus</i> <i>B. phlebotomum</i> <i>Paraphistomum Spp</i>
		2	0.91%	
		11	5.02%	
		29	13.34%	
		3	1.37%	
		1	0.45%	
		13	5.94%	
		5	2.28%	
		1	0.46%	
		2	Ovine	
4	1.83%			
1	0.46%			
3	1.37%			
3.	Canine	3		<i>Ancylostoma caninum</i> <i>Paramhistomum Spp</i> <i>Hookworm</i>
		1	0.46%	
		2	0.91%	
4	Avian	7	3.19%	<i>Eimeria Spp</i>
5	Human	1	0.46%	<i>Enterobius vemicularis</i>
6	Caprine	1	0.46%	<i>Oesophagostum Spp</i> <i>Eimeria spp</i>
			0.46%	

NVRI STAFF PRIMARY SCHOOL

Extra Curricular Activities:

Sports

The school was invited for Corona School Annual Inter-House Sports competition. The girls came First in 4 x 400 metres invitation Relay while the boys came second in 4 x 400 metres invitation Relay.

Annual Graduation, Speech and Prize-Giving Ceremony

The 2005 Annual speech and prize-Giving ceremony took place in July, 2005. Prizes which were sponsored by the Executive Director, Assistant Directors, School Management, Heads of Department, P.T.A.,

Parents and Teachers were presented to pupils who excelled in both academic performances and other activities. The Guest Speaker at the occasion, Dr. Ben. Oladele spoke on the topic, "Managing the School System for National Development". The School graduated one hundred and thirty five (135) pupils. Seventy eight (78) were Nursery III pupils while fifty seven (57) were primary six pupils.

End of Year Activities

The school organized an end of year activity which was covered by the Plateau Radio and Television (PRTV) with Father Christmas in attendance.

ACADEMIC ACHIEVEMENTS IN EXTERNAL EXAMINATION

S/N	NAME OF SCHOOL	NO OF ENTRANCE EXAM.	NO. QUALIFIED FOR INTERVIEW	NO. ADMITTED	PERCENTAGE
1.	National Common Entrance Exam	46	41	AR	89.1
2.	State Common Entrance	63	63	AR	100
3.	St. Joseph College, Vom	13	10	8	61.7
4.	St. Louis College, Jos	6	5	4	66.7
5.	Air Force Comprehensive College, Jos	5	4	AR	80
6.	St. Luke's College, Jos	9	9	8	88.9
7.	Girls High School, Gindiri	5	3	3	60
8.	Boys Secondary School, Gindiri	3	3	AR	100
9.	NVRI Staff Secondary School Vom	45	32	AR	71.1
10.	Mary Immaculate, College, Zawan	2	2	2	100
11.	Rochas Foundation College Jos	1	1	1	100
12.	Capital College, Kaduna	1	1	1	100
13.	Polytechnic Academic, T/Centre	3	3	3	100
14.	Baptish High Schools, Jos	1	1	1	100
15.	ECWA Sec. School Miango	1	1	1	100
16.	Trinity College, Pankshin	1	1	1	100

Cumulative Average = 88.6%

The school has a population of six hundred and ninety two (692) pupils. Three hundred and forty five (345) are boys and three hundred and forty seven (347) girls.

New admissions for the session is seventy (70) pupils.

Staff Training

The under listed staff are undergoing long vacation programmes in various institutions.

S/No	Name	Course Pursued	Contact	Institution
1.	Mrs. W.K. Kalejaiye	M.Ed. Educational Planning & Admin.		Uni. Jos
2.	Mrs. M.A. Adelabu	M.Ed. Social Studies		Uni. Jos
3.	Mr. M.E. Dabere	B.Ed. Educ. Admin/CRS Edu.	5 th	Uni. Jos
4.	Mrs. B.C. Ohaneje	B.Ed. Guidance and Couns./Soc. Studies	4 th	Uni. Jos
5.	Mrs. R.J. Bwas	B.Ed. Economics	5 th	Uni. Jos
6.	Miss M. Ayake	B.Ed. Biology Edu.	4 th	ATBU Bauchi
7.	Mr. H.M. Gwandi	B.Ed. Guidance & Couns./CRS Edu.	4 th	Uni. Jos
8.	Mr. J. Davou	B.Ed. Agricu. Science	3 rd	ATBU Bauchi
9.	Mr. J. Choji	B.Ed. Rekuguib Edu,	3 rd	Uni. Jos
10.	Mrs. C.E. Ibu	B.Edu. Admin. & Planning	3 rd	Uni. Jos
11.	Mrs. S. Damter	B.Ed. Guidance & Counselling	3 rd	Uni. Jos
12.	Mr. M.,G. Bagu'u	B.Ed. Edu. Admin. & Soc. Studies	1 st	Uni. Jos
13.	Mrs. R.S. Ahmed	B.Ed. Edu/Soc. Studies	1 st	Uni. Jos
14.	Mrs. M. Lokoson	B.Ed. Home Econs.	1 st	Uni. Jos
15.	Mrs. C.N. Ogbonnah	N.E.C. Int. Science	2 nd	N.T.I. Jos
16.	Mrs. R. Jonathan	N.C.E. CRs/PES	3 rd	N.T.I. Jos.

NVRI Staff Secondary School, Vom

The NVRI Staff secondary school, Vom in the year ended 2005 was guided by the need to keep alive the philosophy behind its establishment. In achieving these lofty ideals the school propelled with the support of the

Management Board was able to harness the human and material resources at its disposal. This has resulted in the success recorded in the year 2005.

The performance of the students presented for the 2005 external examinations are presented in the tables below:

JUNE/JULY 2005 WASSCE RESULT ANALYSIS

S/NO	SUBJECT	A1	B2	B3	C4	C5	C6	D7	E8	F9	TOTAL	%
1.	CRS	1	1	14	7	5	16	10	14	14	82	82.9
2.	Biology			1		5	16	21	33	25	101	75.2
3.	Economics	1		4	8	12	20	34	16	4	99	96
4.	Physics			5	11	12	19	3	1	1	52	98.1
5.	Home Mgt					1	5	6	2	-	14	100
6.	Geography		1	10	9	9	26	18	9	7	89	92.1
7.	Government			1		2	12	9	16	8	48	83.3
8.	English Language				1	2	15	27	30	26	101	74.2
9.	Mathematics		1		3	2	15	11	19	50	101	50.5
10.	Lit-English			1	1	4	16	16	7	7	52	86.5
11.	Agric Science				1	1	11	21	23	25	82	69.5
12.	Chemistry	1	3	19	4	6	17	1		1	52	98.1
13.	I.R.S.						5	2			7	100
14.	French					1					1	100
% Pass =											86.2	

% at credit level = 48.6

% at Pass level = 86.2

JUNE/JULY 2005 NECO RESULT ANALYSIS

S/NO	SUBJECT	A1	B2	B3	C4	C5	C6	D7	E8	F9	TOTAL	%
1.	English Language				1	3	23	56	13	9	105	91.4
2.	Mathematics				1	1	18	30	42	12	105	89.6
3.	C. R. S.				1	10	26	14	30	10	81	87.7
4.	I. R. S.			1		2	1	1	2	-	7	100
5.	Economics				3	2	10	23	45	18	101	82.2
6.	Geography		2	2	9	13	31	25	3	1	86	98.8
7.	Government				1	3	7	13	19	7	50	86
8.	Lit. English				1	5	8	17	18	2	51	96.1
9.	Biology			1	2	5	9	40	38	10	105	90.5
10.	Agric Sci.				4	22	32	9	17	2	86	97.7
11.	Home Mgt.				5	9	1	-	-	-	15	100
12.	Chemistry				8	7	17	15	5		52	90.4
13.	Physics				2	8	32	4	4	2	52	96.2
% Pass =											92.7	

% at credit level = 44.7

% at pass level = 92.7

Two students from the school namely Emmanuel Ahmadu and Abdulhakeem Momoh participated in the NNPC organized science quiz competition. They won from the Local up to the state levels and were among the three students who represented Plateau

State at the North Central zone competition held at Lafia with five (5) states and FCT in attendance. The state emerged third position.

Sports

The Athletes from the school participated in various competitions within and outside the state and won some laurels. Worthy of mention is the heart warming performances of Bridget Gyang at the National level in the 5,000 metres long distance event at Enugu. She has qualified to represent the country at the 2006 Common Wealth games which would hold in Australia later in the year.

Speech and Prize Giving Ceremony

The school had a colourful speech and prize giving ceremony on the 20th July, 2005. Students who excelled in academics and other valued areas were rewarded. The Management and other well meaning individuals identified with us for the overall success of the programme.

HIV/AIDS Awareness Programme

In order to raise the awareness on the scourge of HIV/AIDS, the School embarked on a collaborative programme in conjunction with the Plateau State Action Council on AIDS (PLACA) and the Peer Education group. This programme involved the training of ten students who were in turn to serve as facilitators among the students. The programme commenced in October 2005 and lasted for a period of six months.

Staff News

The school lost a teaching staff, Mrs. Jessica Chinles on 9th August, 2005 after a prolonged illness. The appointment of a staff Mr. E.D. Bwede was terminated in July 2005 for gross misconduct. Two teachers were posted to the secondary section from the primary section to increase the staff strength. The affected teachers are, Mr. I. Okezie (Social Studies) and Mrs. M. Ngbede (Home Economics). Mr. A.A. Adedeji an English teacher retired from the service with effect from 1st January, 2006.

Harmonization of Teacher's Salaries with the Main Institute

The NVRI Management in a rare show of Magnanimity in July 2005 harmonized the teachers' salaries with that of the main line Institute. Thus, teachers have been placed on HATISS. This has boosted the morale of the staff and they are full of gratitude to the Management.

Prayers

While the school continues to appreciate the unquantifiable support from the management of the Institute, we wish to appeal that the following problems areas should be looked into, (a) employment/replacement of teachers to cover the core subject areas of English Language, French, Music, Physical and Health Education (PHE) and Fine Arts and (b) resumption of work on the permanent site of the Secondary school

Printing and Publications Department

This supportive arm of the Institute undertook the printing of all the official documents of the Institute, handled commercial jobs and generated revenue from commercial jobs in the year 2005. Official jobs done included the printing of all the needed copies of various vaccine labels, sales invoices, petty cash vouchers, transfer issue vouchers, Outstation vaccine sales invoices and treasury receipt books.

Other materials printed were the NVRI 80th Anniversary Book of Proceedings, Info Newsletter, NVRI Mission Statement/Mandate, NVRI/Guidelines for management, NVRI Journal of Pest Disease and Vector, 2003 Annual Report and posters on Bird flu. Receipt books for NVRI Cyber café and Vom Journal of Veterinary Science were also printed.

During the period under review the Printing and Publications Department was able to execute many commercial jobs from which more than two million naira was realized.

The department handled the publication of Guidelines for Research Institutes and other publications submitted by the Federal Ministry of Agriculture and Rural Development. Customers' patronage has continued to increase as a result of quality service delivery.

Library and Documentation Department

The department has 6 professional librarians, 6 Library Assistants, 2 Library attendants and 3 cleaners. The library has served as a veritable source of information facilitating access to literature for the research scientists in the Institute and other clientele during the year. The objective above is made possible by the training programme of the Institute. Three of the Library staff are currently on training.

Fifteen Books titles were bought in the year 2005 and 20 books were donated to the Library by FAO and ACIAR.

During the year, technical reports from agencies like F.O.A, Australian Centre for International Agricultural Research (ACIAR) etc. dominated the list of materials received and processed. 27 technical reports and 105 text books were catalogued and classified.

The library was well patronized by the readers during the year. 745 students registered as members of the library. Lending services were impressive, 2842 loan records of books were made to the readers. The clientele record maintained was 4234 in the year. Books on the Reserved Section were adequately consulted by the students and research officers accordingly.

The automation exercise of the library resources and service is in progress. In connection with this, the Director has supplied Computer system which has higher capacity and configuration. This has not only boosted our morale but has enhanced our performance.

Quality Control Department

The department undertakes regular batch release testing of vaccines to ensure quality of products. Tests include all aspects of sterility,

purity, safety, potency and freedom from contamination with extraneous agents. It also maintains and checks quality, from time to time, of seed cultures of vaccines produced by the institute. It develops and enforces standard operating procedures (SOP) for activities. Some of the tests were carried out with the assistance of Bacterial and Viral Research Departments.

During the year, 7 batches of Newcastle Disease Vaccines were tested and six of them were approved for circulation based on titre, purity and past batch performance for use in the field. One batch was rejected due to very low titre.

Bacterial vaccines tested were CBPP (5), HSV (4), Anthrax (2), FCV (4), Hantavac (3), and FTV (3). The pH of some of the liquid vaccines were found to be low (5-6) and the producers were notified to do appropriate adjustments. The purity, viability and counts of the live vaccines were within acceptable levels and were passed for use on the field.

Two of the staff of the department who had been on training, Mr. Kwatjel Jephtha and Miss Bako Fatima completed their Bachelor of Medical Laboratory Science courses (BMLS) and are currently on Internship practical exposure in the Institute.

Workshop Department

The workshop department has nine sections and staff strength of 67 persons trained in various technical fields.

The maintenance Section serviced and maintained the Institutes generators located in the workshop, Dagwom farm, Poultry department, ATMN Dam and at the PWD by Large Animal Experiment Station.

The Welding Section produced 28 metal doors, 1 water tank, street lights covers, reinforced 15 gates for the paddocks, and changed harmer mill of the Institute milling machines. This Section also handled the fixing

of burglary proofs in the Institute laboratories and staff quarters.

The Building Section built underground septic tanks, fixed ceramic wall tiles in the chalets of the guest house, built store house at the staff school and fixed burglary proofs and air conditioner in the laboratories and staff quarters.

The Carpentry Section was involved in producing new hatchery and setting trays for poultry Department, Renovation of guest house furniture, construction of new lockers and setting stools in Virology. It also handled the re-roofing of Chaha house.

Other Sections which carried out a lot of technical activities and facilitated the smooth running of the Institute from the Workshop department includes, Electrical Section, Plumbing Section, Painting section, Mechanical Section and the Driving Section

Veterinary Extension & Research Liaison Service

The staff strength of the Department is Seven (Two veterinarians and five technical staff).

The National Veterinary Research Institute (NVRI) reaches all the farmers in Nigeria through the Veterinary Extension and Research Liaison Service (VERLS) Department. The aim is to ensure healthy and productive animals to provide the much needed animal protein and disposable income to the farmers.

A total of 85 radio programs on different aspects of livestock health, management and production were produced. Thirty of them were programmes on “Itoju ohun osin” on Federal Radio Corporation of Nigeria (FRCN) Ibadan; thirty five were on “Muleka rugage” on FRCN Kaduna and 20 were on ‘Ahu ike umu anumanu’ (Igbo)/Animal health time (Pidgin English).

Accounts Department

Eight new Accountants were employed to boost the staff strength of the Department in

the year 2005. Some of them will be posted to the Outstation Laboratories.

For efficient performance, training has been made a priority in the department. In-house training lecture whereby staff rotationally present papers is another avenue where staff are exposed to knowledge and skills outside their schedule of duties. It holds fortnightly and covers areas in Accounting, Management, Finance and Current Affairs.

Some of our staff under went training with the Nigerian College of Accountancy, Jos. They are Mr. U.M. Mshelbila, Mr. T. O. Ogunwola, Mrs. Mary J. Vungmo and Mr. Gabriel Adama. Two of our staff attended the Mandatory Continuing Professional Development (MCPD) programme organized by the Association of National Accountants of Nigeria and while the Head of Department attended a mandatory professional training organized by the Chartered Institute of Taxation of Nigeria. The marketing Unit and the costing unit have been set up though they are still in infant stages of development. The Computerization of the Department's activities is almost nearing completion reducing our dependence on manual methods.

Security Department

This department has staff strength of 104 persons. These staff are distributed as follows: Main Institute; 55 persons, FCAHPT (16), FCVMLT (19), Boreholes (11), and Staff Schools (3). With the staff strength above, the department covers 60 beats. Duties performed during the period included general security services, intelligence gathering and investigation to establish reported cases.

Achievements recorded during the period under review were, protection of lives and property in the Institute and Colleges, effective surveillance of Installations, counselling of students to prevent all kinds of vices etc.

To further boost security in the Institute, Management approved the re-establishment of

the Institute's Police Station. Twenty one (21) policemen and women were deployed headed by an Assistant Superintendent of Police (ASP).

The department will be grateful if Management will increase the staff strength to 165 to enable us place staff on 8 hour shifts instead of 24 as currently practiced on some of our beats. Provision of a Patrol vehicle to the security department in 2006 will enhance our performance especially in respect of some distant areas like Dagwom farm, LID, Poultry, Aso Rock Hostel, residences of the two Provosts, etc

Viral Research Department

Activities of the department in 2005 include epidemiological surveillance of all viral diseases of livestock notably African swine fever virus (ASFV) in Nigerians pigs, Peste des Petits Ruminants (PPR), Para influenza (PI-3), Rinderpest, Rabies and poultry including Avian Influenza, Newcastle Disease, and Infectious Bursal Disease. Others activities are in-depth laboratory diagnosis of samples from outbreaks, research on the agents of diseases listed above, development of viral vaccines; notably Cell Culture Rabies Vaccine, EDS, Marek's Disease vaccine, Lumpy skin Disease, Sheep pox and Goat pox vaccines. The department was also engaged in the development of sera and biologicals for diagnosis and research of viral diseases of veterinary importance and carries out quality assessments of viral vaccines, sera and biologicals.

Many members of the department participated in various trainings in the course of the year. Some of those who benefited were: Drs. T.M Joannis and E.P Aba-Adulugba —Viral Vaccines Production at the Laboratoire National Veterinaire (LANAVET), Garoua, Cameroun. September-October, 2005, Dr. S. A. Abechi—Ph.D Unimaid, Dr. J. O. Ibu, Ph.D. UNN, Dr. N. J. Luther—MSc A.B.U Zaria and Dr. A. C. Meseko—MSc Virology Ibadan

Diagnostic Department

Rabies Unit

From January 2005 to December 2005, the unit received a total of 184 samples for rabies diagnosis out of which 89 were positive by the impression smear method, 87 samples were negative while 8 were putrefied and therefore not suitable for the test.

The Large Animal Experiment Station

The station is responsible for the management of livestock and poultry being used for experiments in the Institute.

In the year under review 16 cattle, 5 sheep, 4 goats, 335 chickens and one hundred (100) quails were used for various experiments and research work in the Station. Experiments done in the unit in 2005 included; Vaccination of chicken with *Pasterurella multocida* iron-regulated bacterial vaccine (by Bacterial Research Department), Pathogenicity studies of *D. congolensis* in cattle (Bacterial Research Department), Potency and safety testing of fowl typhoid vaccine (Bacterial Vaccine Production Department), development of capripox vaccine (Viral Research Department) and characterisation of Newcastle disease virus isolates using intravenous pathogenicity index (Viral Research Department). Others were; se of mango seeds as energy source in quails feed (Federal College of Animal Health & Production Technololgy), production of anti sheep/rabbit immune serum by I.V. injection of washed SRBC, serially (Federal College of Veterinary and Medical Laboratory Technology) and plant extract for the production of Newcastle Disease Antibodies in birds (Biochemistry Department).

A staff of the section, D.Ngaji underwent a certificate course in Poultry Management. In the year under review, the Station received 47 (forty seven) students on industrial attached.

Bacteriology Unit

During the year under review, the unit was able to receive and process a total of 422

samples from different locations and different species of animals. The samples treated were those of Avian (204), cattle (44), sheep (11), goats (11), dogs, laboratory animals (30), zoo/wildlife animals (5) and fish (43). Different diagnoses were read from the cases.

Small Animal Unit

This unit was able to raise 406 mice, rabbits 28, rats (73), guinea pigs (132) and grass cutter (4) for experimental purposes in the year 2005

Wildlife and Aquaculture Unit

This unit, which is still new, received five cases between June and October 2005. These were hippo, elephants and gazelle. The pigmy hippo and gazelle were positive for anthrax. Two fish samples were brought for microscopy and bacteriological tests. *Eimeria carpelli* and *Pseudomonas aeruginosa* were isolated. Fifty seven others were brought for bacterial isolation from Kainji Lake Research Institute. The results revealed that ten different bacteria were isolated viz: *Beneckea*, *citrobacter*, *Aeromonas*, *streptococcus faecalis*, *E.coli*, *klebsiella*, *salmonella*, *pseudomonas*, *Yesinia*, and *moraxella sp.*

Other Activities Of The Department

Shendam Outstation laboratory has been earmarked for the project on Anti snake venom research because of availability of some facilities ideal for snake rearing and because snakes are easier to source from there.

To kick start this unit installation of a split A/C and provision of standard storage boxes have been done.

Plans are underway to construct earth ponds, close to the Department for work on aquatic research in the department

Epidemiology Unit

This Unit was created to receive reports coming from outside, collate and keep such reports for analysis and maintain data base.

The Unit now has a computer and has succeeded in collating the Pace programme reports for 2004 and 2005. Following the outbreak of the Bird flu a data base update has been created.

Parasitology/Clinical Pathology Unit

This unit of the Department conducts the following tests: Packed cell volume, Haemoglobin concentration, Total Leukocyte count, Total conjugated serum bilirubin, serum total protein, serum albumin, SGOT, SGPT, Serum Alkaline phosphatase, BUN, and Serum creatinine, etc.

Histopathology Unit

In the year under review this unit received a total of eighty seven (87) cases for processing and reading. One of the staff of this unit, Mrs Laraba Gyang completed her course and resumed work

Administration Division

The Division is charged with the responsibility of assisting the Management in the day to day Administration of the Institute in matters relating to establishments, Staff Welfare, Maintenance of records, Appointments, Retirements, Security, etc.

Below are details of what transpired in the year 2005:

A. TRAINING

S/N	NAME	RANK	TYPE OF TRAINING	DURATION	HATISS
1.	Dr (Mrs) Maryam	CVRO	Ph.D Vet Medicine	3 yrs (P/time)	13
2	Moh=d	Hg.Med. Lab Asst.	Med Lab Tech Cert	36 Months	4
3	Mrs Mary Abubakar	ACVRO	M.Sc Vet Med.	24 months	12
4	Dr. M.H. Abdu	Res. Officer II	M.Sc Zoology	24 months	8/6
5	Mrs Rebecca A. Yakubu	Prin. Librarian	MLS	24 months	11/2
6	Mrs. Lydia Lakan	VRO II	M.Sc. Vet Medicine	24 months	8/2
7.	Dr. James Dalis	SVRO	M.Sc Vet Medicine	36 months	11/5
8	Dr. Peterside Kumbish	PVRO	PhD Vet Medicine	60 months	11
9	Dr. Musa Usman	ACVRO	PhD Agronomy	(P/time)	12/5
10	Mr. Sunday A. Ogedegbe	CVRO	PhD Vet Medicine	60 months	13
11	Dr. Stephen Abechi	L/ Overseer	Med. Lab. Asst. Cert.	(P/time)	3/1
12	Mrs. Angelina Dalyop Mr. Gablong P. Litwat	Med. Lab Tech.	AILMT	36 months	6

B. RETIREMENT

S/N	NAME	RANK	HATISS	DIVISION	Date of Retirement
1.	Mr. Ezekiel Pwajok	Higher Med. lab Asst.	4	Epidemiology	1/1/05
2	Mwanti Nangut	Head Cleaner I	3	Admin	1/1/05
3	Mr Dauda Juna	Head Cleaner I	3	Environmenta	1/1/05
4	Mr. Mohammadu Ahmadu	Asst. Craftsman	3	1	1/1/05
5	Mr. Lucas Badung	Snr. Med. lab Tech.	8	Workshop	19/2/05
6	Mr. Ayuba MaiMusa	Snr Exe. Off. (GD)	8	Bact. research	5/5/05
7	Mr. Abah Agbaji	Snr.Craftsman	4	Admin	13/5/05
8	Mr William Adedokun	Snr Foreman	6	Workshop	30/5/05
9	Mr. M.M. Nungul	Chief Admin Off.	13	Workshop	15/9/05
10	Mrs. Charity J. Lar	Head Cook	4	Admin	5/12/05
11	Mr. P.K Yamusa	ACEO	12	guest house	1/9/05
12	Mr. Gregory Pwajok	HTO	7	Admin Workshop	1/11/05 (Voluntary)

C. BEREAVEMENT

S/N	Name	Rank	HATISS	DIVISION	Date of Death
1.	Mrs. Jessicah Chinle	Asst. Educ. Officer I	7	Staff School	9/8/05
2.	Mr. David Paul	Sec. Guard/Patrolman	7	Security	24/9/05
3.	Mr. Ali A. Dasher	Head Security/Snr Patrolman	3/1	Security	8/7/05
4.	Mr. Davou Gyang Billi	Snr. Sanitary Attendant	2/13	Environmenta 1 Unit	22/10/05

D. TERMINATION OF APPOINTMENT

S/N	Name	Rank	HATISS	DIVISION	Date of Termination of Appointment
1.	Ahmed D. Musa	Asst. Craftsman	02	Workshop	21/2/2005
2.	Mr. Elisha D. Bwede	Asst. Educ. Officer II	07	Staff School	1/7/2005
3.	Mr. Raymond Danladi	Stores Assistant	02	Stores	28/9/2005
4.	Mr. Philip T. Chakven	Livestock Overseer	03	Dagwom Farm	25/11/2005

E. DISMISSAL

S/No.	Name	Rank	HATISS	DIVISION	Date of Dismissal
1.	Mr. Livinus Amana	Chief Livestock Overseer	7	Poultry	8/8/2005

F. TRANSFER

S/N	Name	Rank	HATISS	DIVISION	Date of Transfer
1.	Mall. Umar. B. Badiya	Head of Admin.	14	Admin	-

STAFF PROMOTION	-	58
No of Corpers Admitted	-	14
No. of Industrial Attachment Students	-	173



Open Day with Fulani Pastoralists



Send off party for 2005 NYSC Members



Graduation Ceremony of NVRI Staff Primary School



Airport Reception for the Executive Director on her reappointment for another Tenure as the Executive Director of the National Veterinary Research Institute, Vom